NOTES.

A BILL dealing with the question of technical education was submitted to the House of Commons on Tuesday, and read a first time. We print elsewhere the speech delivered by Sir W. Hart Dyke in introducing the measure.

THE Report for 1886 of the Science and Art Department has just been issued.

THE summer meeting of the Institution of Mechanical Engineers will be held in Edinburgh, on Tuesday morning, August 2, and Wednesday morning, August 3, in the University. The chair will be taken at half-past nine o'clock by the President, Mr. Edward H. Carbutt, in the Natural History Lecture Theatre. The following papers have been offered for reading and discussion, not necessarily in the order here given:—On the structure and progress of the Forth Bridge, by Mr. E. Malcolm Wood, of London; notes on the machinery employed at the Forth Bridge works, by Mr. William Arrol, of Glasgow; on the paraffin oil industry in Scotland, by Mr. St. John V. Day, Honorary Local Secretary; description of the electric light on the Isle of May, by Mr. David A. Stevenson, of Edinburgh; description of the new Tay Viaduct, by Mr. Fletcher F. S. Kelsey, Resident Engineer; on electro-magnetic machine-tools, by Mr. Frederick John Rowan, of Glasgow; on the dredging of the lower estuary of the Clyde, by Mr. Charles A. Stevenson, of Edinburgh; on the position and prospects of electricity as applied to engineering, by Mr. William Geipel, of Edinburgh. Various excursions are being arranged, and it is desired that members who propose to be present, and to accept the several invitations, should let their intention be known without delay.

THE summer meetings of the Institution of Naval Architects will be held at Newcastle-on-Tyne on July 26 and 28, and at Sunderland on July 27. The following papers will be read at Newcastle: on the application of hydraulic pressure to naval gunnery, by the Right Hon. Lord Armstrong, F.R.S. Vice-President, and Mr. J. Vavasseur, Associate; recent developments in marine engineering, by Mr. Frank C. Marshall, Member of Council; Tyne improvements, by Mr. P. J. Messent, Engineer to River Tyne Commissioners. At Sunderland the following papers will be read: on some recent experiments with basic steel, by Mr. W. H. White, Director of Naval Construction, Vice-President; on the present position occupied by basic steel for ship-building, by Mr. B. Martell, Chief Surveyor to Lloyd's Register of British and Foreign Shipping, Vice-President. There will be excursions to places of scientific interest in the neighbourhoods.

MR. THOMAS HUDSON BEARE has been unanimously appointed by the Governors of the Heriot-Watt College, Edinburgh, Professor of Mechanics and Engineering in that institution. Mr. Beare came over to this country from Australia in 1880, having gained the South Australian Scholarship at the University of Adelaide. He then became a student at University College, London, to which he afterwards returned about three years since to be one of the principal demonstrators under Prof. Kennedy in the Engineering Laboratory.

THE Geographical Society of St. Petersburg has decided to send an Expedition to Turkestan for the scientific investigation of the earthquake at Werny. Prof. Muschketoff, the head of the Expedition, will be accompanied by five other men of science, including the St. Petersburg geologist, M. W. S. Dmitrewski.

THE seventh Bulletin of Miscellaneous Information, issued from the Royal Gardens, Kew, contains a careful and interesting paper on annatto, a colouring substance obtained from the seeds of *Bixa Orellana*. This colouring substance has long been known and used for various purposes. It is, however, liable to so many fluctuations, and the prices generally are so low, that it has never received serious attention in British colonies, and hence few, if any, plantations have been exclusively devoted in such colonies to the annatto plant. The annatto of commerce is practically a forest product obtained from wild or semi-wild plants, and the supply has only kept pace with the demand. Of late years a slight revival has taken place in the use of annatto, especially in America, and inquiries have in consequence been made for information as regards culture and preparation. This information the writer of the paper in the Bulletin supplies, and his notes will be of great service to all who may wish to become growers of annatto.

ON May 9 the Governor of Jamaica addressed to the Governors of Barbados, the Leeward Islands, the Windward Islands, and British Honduras, a letter relating to the scheme for the establishment of botanical stations in some West India Islands in connexion with the Botanical Department in Jamaica. From this letter, which is printed in the seventh Kew Bulletin of Miscellaneous Information, we are glad to learn that the Government of Jamaica is prepared to adopt the proposed scheme from August 1, or from any subsequent date.

BEFORE the end of the year the great Tweeddale collection and library will, it is hoped, be safely housed in the Natural History Museum. This princely donation to the national collection is the gift of Capt. R. G. Wardlaw Ramsay, to whom it was bequeathed by his uncle, the late Marquess of Tweeddale. With the exception of the Hume Collection it is the finest series of Indian birds in existence, and is especially rich in species from the Philippine Archipelago, where Mr. Alfred Everett collected for some years for Lord Tweeddale. Capt. Ramsay's collections from the Karen Hills, in Burmah, are also most important, this being one of the few localities unworked by Mr. Hume's collectors.

THE American Museum of Natural History, New York, has just acquired the ornithological library of Mr. D. G. Elliot, a well-known American naturalist. This library consists of about 1000 volumes, and is one of the most important in America. Mr. Elliot has at the same time presented his collection of humming-birds to the above Museum. It is, according to the *Auk*, "represented by about 2000 specimens, and includes some fifty or more types. Its importance is further enhanced from its having formed the basis of Mr. Elliot's recent monograph of the family. It doubtless ranks as second in the world in point of completeness, or next to that of the British Museum." The latter collection, however, must now contain at least 10,000 skins, irrespective of the Gouldian series of mounted specimens. Another important addition to the American Museum is that of the large ornithological collection of Mr. G. N. Lawrence, which contains some 300 types. This has been purchased, and is one of the chief of the private collections in America.

THE special groups, illustrating the nesting habits of British birds, which have proved so attractive in the Natural History Museum at South Kensington, have now been introduced into the galleries of the American Museum of Natural History, and twelve cases of American birds have already been mounted. The cost of these effective, but expensive, groups will be defrayed by Mrs. Robert E. Stuart, and the Museum has secured the services of Mrs. Mogridge, who executed the artificial flower-work for the British Museum. Mrs. Mogridge is without a rival in this branch of decorative art.

THE expedition made by Mr. John Whitehead to the great mountain of Kina Balu, in Northern Borneo, has turned out more successful than could have been foretold. In addition to the splendid new Broadbill, described by Mr. Bowdler Sharpe as *Calyptomena whiteheadi* at the last meeting of the Zoological Society, there are nearly twenty other new species, including some very remarkable forms of *Arachnothera, Chloropsis, Cryptolopha,* and an apparently new genus of *Campophagidæ.* These will all be described in the October *Ibis*, by Mr. Sharpe.

DEALING with the question as to the influence of small birds in assisting the extinction of *Aporia cratægi*, Mr. A. G. Butler, in the current number of the *Entomologist's Monthly Magazine*, says he has collected in Kent for at least thirty years, and during the whole of that time he has never seen any bird but a sparrow attempt to catch a butterfly. Nor has he ever known a small bird to eat a large caterpillar if it could get one that could be more easily swallowed. "Of our indigenous species," he says, "the robin and the great tit certainly select green caterpillars in preference to others, and, when feeding their young, I have watched both these birds with their mouths full of the green pests of the gooseberry and currant. From observation of cage-birds I should say that the finches certainly show a similar preference, the green larvæ of *Mamestra* being chosen before the brown, though all are greedily devoured."

A BOLD attempt has recently been made to penetrate the darkness surrounding the subject of the inter-molecular arrangement of atoms, and to raise our ideas of the constitution of chemical compounds beyond what is expressed by the orthodox chemical formulæ. It has long been felt that the chemical formula of a substance as expressed in one plane on paper, although invaluable as far as it goes, must of necessity be a very misleading one, inasmuch as it in no way indicates the probable position of the various atoms in space. This insufficiency has been especially felt in the case of substances like tartaric acid, where we have several distinct isomers acting quite differently upon polarized light, and frequently forming right- and left-handed hemihedral crystals, although expressed by the same constitutional formula. Since the year 1874, when Van t' Hoff and Le Bel published their celebrated theory of the "asymmetric carbon atom," the idea has been gaining ground that this kind of isomerism must be due to different spacial arrangement, and Van t' Hoff gave impetus to the theory by showing that the existence of four isomeric tartaric acids could be explained by imagining the four radical-groups to be variously placed at the four corners of a regular tetrahedron, of which an asymmetric carbon atom occupied the centre. During the last few days a comprehensive paper has been issued by Prof. J. Wislicenus, on the "Spacial Arrangement of Atoms in Organic Molecules, and its Determination in Geometrically Isomeric Compounds," further expanding Dr. Van t' Hoff's somewhat sceptically received ideas, proceeding to build up the spacial constitution of a large number of unsaturated organic compounds, and giving nearly 200 figures, of which the regular tetrahedron representing CH_4 is the base. Prof. Wislicenus practically demonstrates that the cases of so-called abnormal isomerism may be completely cleared up, and that existing experimental data are generally sufficient to enable spacial constitution to be determined. This remarkable paper will doubtless give rise to much discussion, and appears likely to lead to results which will mark a genuine advance in chemical philosophy.

IN a paper to the Berlin Academy, Herr Liebreich lately called attention to what he calls the "dead space" in chemical reactions: a space, *i.e.*, in which the reaction going on in other parts of a uniformly mixed liquid does not occur, or occurs late, or in less degree. It may be very well observed, *e.g.*, in decomposition of chloral hydrate by sodium carbonate (yielding chloroform) in a test-tube. A layer of 1 to 3 millimetres' depth under the surface remains clear, and separate by a convex surface from the "reaction space," where the solution is turbid from droplets of chloroform. Even after twenty-four hours' rest of the mixture the two spaces can be distinguished; and after mixture by shaking again, the surface of separation is reproduced in a few minutes. In horizontal capillary tubes the dead space appears on both sides, and, if the liquid columns introduced are short, no reaction occurs, as the dead spaces unite. Thus is explained the absence of reaction in the case of liquid absorbed in vessels by glass pearls; there is dead space everywhere. Contact with air seems essential to the formation of dead space. Thus if a vessel closed at one end, and holding the liquids above named, be inverted, so that there is no air space above the mixture, the reaction occurs uniformly throughout. But if the upper end be closed with a fine animal membrane, the dead space appears as in the former case; and if the lower end be also closed with fine membrane the dead space appears there too. Herr Liebreich is studying the phenomena further.

SOME instructive experiments on atmospheric electricity are described by Herr Nahrwold in *Wiedemann's Annalen*, No. 7; one being a suitable lecture experiment, showing the action of electricity from points on finely divided matter in the air. He thinks it established that such a stream of electricity does not electrify the air itself statically (indeed that air and other gases probably cannot be statically electrified), but only dust particles in it. Further, a glowing platinum wire sends out particles which diffuse in air that has been electrically freed from dust, making a fresh charge possible. Here, too, the electricity streaming from such wire does not statically electrify the air, but the charges which are observed as atmospheric electricity belong to fine non-gaseous particles given out by the wire, or already present in the air. An experiment is also adduced to show that at ordinary temperature negative electricity of high potential streams more readily from solid conductors into atmospheric air than positive.

ELECTRICITY in the house has some important bearings on hygiene. One of these M. Sambuc has recently called attention to (*Revue d'Hygiène*), in the liberation of hydrogen, where strong batteries are used in which zinc is dissolved by sulphuric acid. Besides the danger of shattering of the vessels, the hydrogen spreading in the air may form an explosive mixture; and it may have a cooling effect through its great conductivity for heat. It also deadens the voice and alters its timbre. Further, if, as may be, the hydrogen is charged with sulphur, arsenic, phosphorus, carbon, or silicium, there are other and greater dangers. A chemist is known to have died from breathing a little arsenietted hydrogen. These facts are not cited against the use of the electric light, but to induce proper care in those who use it.

THE twenty-sixth volume of the magnetical and meteorological observations made at the Government Observatory, Bombay, containing the results for the year 1885, has just been published, under the superintendence of Mr. C. Chambers, F.R.S. Continuous registrations are obtained by means of self-recording instruments (although not published), and eye-observations are taken five times a day, as a check upon the automatic records. The following is a summary of the principal meteorological results:—The mean barometric pressure for the year was 29·826 inches, the difference of the greatest and least mean daily pressure amounting to 0·581 inch. The mean annual temperature was 79°·2, and the greatest daily mean was 87°·3 on June 6. The absolute maximum was 91°·8 in June (being slightly *lower* than the maximum in the shade at Greenwich on the 4th inst.), and the minimum 62°·1 in February, giving a range of 29°·7. The rainfall measured by a gauge 4½ feet above the ground was 67·91 inches; rain fell on 113 days, and mostly occurred between June and September; the greatest fall was 10·29 inches on August 15.

The Observatory does not appear to possess a sunshine-recorder. Observations for a few selected hours for Bombay and five other stations for the years 1885–86 have already been published separately by the Indian Meteorological Office.

METEOROLOGICAL observations have been regularly made at the Khedivial Observatory at Cairo (Abassieh) during the past five years, and have been published in various forms. The publication has now assumed a more definite shape, under the title, *Résumé Mensuel*, and is issued by the Ministry of Public Instruction. The observations are taken every three hours during the day and night. Yearly summaries are not given, but we find from the monthly values that the mean shade temperature for the year 1886 was 69°·6. The absolute maximum in the shade was 113°·4 in June, and the minimum, 36°·7, in December; giving a yearly range of 76°·7. The thermometers are placed much too high, being about 33 feet above the ground, instead of about 4 feet. The amount of rainfall is not regularly published.

THE Jahrbuch of the *Magdeburgische Zeitung* for the year 1885 (Magdeburg, 1887, 88 pp. 4to) contains, in addition to the usual observations and reproductions of the continuous registrations of barometer and sunshine-recorder, a table showing the extremes of temperature on the surface of the earth observed by means of five maximum and five minimum thermometers, one pair lying flat and the other four pairs being inclined about 45° under the four principal points of the compass, between May 1885 and April 1886; but there is no discussion of the results. There is also an interesting appendix relating to the choice of hours that will give the nearest approach to the mean daily temperature. The author has used the continuous records for Berne, Vienna, Magdeburg, Pawlowsk (near St. Petersburg), and Upsala for a year, and has found the following to be the mean values of the corrections to be applied to the various yearly means:—For 8h., 2h., 8h., 0°·040; for 7h., 2h., 9h., −0°·092; for 6h., 2h., 10h., 0°·104; and for max. and min. 0°·084. The best combination according to this investigation is therefore 8h., 2h., 8h., whereas in this country 9h. a.m. and 9h. p.m. are found to give a good mean. The combination of max. and min. also gives a fairly approximate value for mean latitudes. The author has also investigated the epoch of the maximum and minimum temperature for the same places, and shows how the highest daily temperature occurs later as the summer advances, being at about 3h. p.m. in June and July and between 12h. and 1h. in January and December; and further, that the lowest temperature does not always take place at about sunrise, as is generally supposed, but only during summer, while in winter the minimum is near midnight. The present Director of the Observatory is A. Grützmacher; the former Director, Dr. Assmann, having been appointed to the Meteorological Office at Berlin.

MR. A. L. ROTCH has published the results of the observations made at the Blue Hill Meteorological Observatory, Norfolk County, Massachusetts, U.S., in the year 1886 (NATURE, vol. xxxv. p. 472). This Observatory, which was established by Mr. Rotch in 1885, is now one of the best-equipped stations in the United States, and the current expenses amount to about 2500 dollars a year. An auxiliary station has also been established at the foot of the hill, 440 feet below the Observatory, and some curious variations of temperature and precipitation have been noted between the two stations, but enough data have not yet been accumulated for publication. Among the special instruments in use may be specified a Campbell-Stokes bright-sunshine recorder, which is believed to be the only one in the United States; a Jordan sunshine-recorder, which registers both bright and faint sunshine photographically; and a mirror for the measurement of the azimuth and altitude of clouds, but these results are not yet ready for publication. The mean temperature for the year was 45°·6. The absolute maximum in the shade was 91°·0 in July, and the minimum −15°·0 in January, giving a yearly range of 106°. The greatest daily range was 38°·2 on December 25, and the least 1°·7 in February. The total rainfall and melted snow was 46·99 inches, measured on 132 days; the greatest monthly fall being 8·29 inches in February, and the least 1·52 inch in June. The work is accompanied by tracings from the self-recording instruments, selected to illustrate certain phenomena during the year, with explanatory text, a practice which is both inexpensive and very instructive. The hourly tabulations of atmospheric pressure and wind velocity have been published *in extenso.*

ON February 5 last there was a shower of ashes, lasting from 7 a.m. to 11 a.m., at Finschhafen in Kaiser Wilhelm's Land. It covered the surrounding district with a layer of pale grey volcanic ashes. As the condition of the winds at the time was abnormal, it is impossible to say in what locality the volcanic eruption took place. Dr. Schrader reports that on February 2 a bright red halo, as if produced by smoke at a great elevation, was noticed around the sun; a few evenings before, similar halos had been noticed around the moon. Samples of the ashes have been sent to Dr. Neumayer, of Hamburg, for analysis.

SOME time ago, Mr. F. W. Putnam, the American archæologist, wrote a letter to the newspapers, pointing out that the Serpent Mound in Adams County, Ohio, had lately been much damaged by "wash-outs," and begging that steps might be taken for its preservation. Thereupon three Boston ladies took the matter in hand. The money they asked for was soon obtained, and now the ground upon which the mound is situated has been bought, and handed over to the guardianship of the Trustees of the Peabody Museum of American Archæology and Ethnology. Mr. Putnam, through whom the purchase was effected, proposes to spend the approaching autumn in the neighbourhood of the mound, restoring it where it has been injured, transforming wheat-fields into grass lawns, making paths and fences, and planting trees. "So long as the place is respected and guarded by all who visit it," he says in a letter to a Cincinnati newspaper, "the park will be free to all, but should any vandalism be committed, an arrangement would at once be made to put a keeper at the place, and possibly entrance fees would have to be charged in order to pay the expenses."

PROF. A. H. KEANE'S translation of "The Necropolis of Ancon, in Peru," a German contribution to our knowledge of the culture and industries of the empire of the Incas, presenting the results of excavations made on the spot by W. Reiss and A. Stübel, has been issued in fourteen parts by Messrs. A. Asher and Co. during the years 1880–87. The work is now ready in three volumes, which contain, besides a comprehensive text, 141 coloured plates in folio. A separate volume, complete in itself, but at the same time forming a supplement to the present work, is in course of preparation. It will contain treatises by Herren W. Reiss, A. Stübel, L. Wittmack, R. Virchow, and A. Nehring.

WE have received Part I. of the Annual Report of the Board of Regents of the Smithsonian Institution, showing the operations, expenditures, and condition of the Institution, to July 1885. In addition to the Secretary's Report, there is a general appendix containing some valuable scientific papers. In one set of these papers an account is given, by eminent writers, of the progress made during the year 1884 in astronomy, geography, physics, chemistry, and other sciences. Other papers deal with various problems in anthropology.

THE Clarendon Press is publishing a fourth edition of "Exercises in Practical Chemistry," by Mr. A. G. Vernon Harcourt, F.R.S., and Mr. H. G. Madan. The first volume, containing elementary exercises, has been issued. In the preface to this new edition, Mr. Madan, who has undertaken the task of revision, explains that he has made some verbal alterations, introduced additional experiments and exercises, and somewhat altered the course of analysis of a single substance. In many cases the preparation of useful compounds of the radicle is more fully dealt with than in former editions.

THE "Flora of West Yorkshire," a volume of about 800 pages, by Mr. Frederick Arnold Lees, will be ready in August. It will be published by the Yorkshire Naturalists' Union, by subscription, and will form an extra volume of the Botanical Series of the Transactions of the Union. The work is divided into four sections—(1) Climatology; (2) Lithology; (3) the Botanical Bibliography of the Riding; (4) the Flora proper. With regard to the fourth section, it is claimed that "such a complete flora for any district in the world has never before been published, more than 3000 species being dealt with."

AN interesting volume relating to the "Grand Concours International des Sciences et de l'Industrie," which is to be held at Brussels in the year 1888, has just been issued. It consists of reports drawn up by the Committees which have been appointed to make preparations for the Exhibition. Each of these reports includes a letter addressed to producers, a general and detailed classification of objects, a list of sub-committees, and a series of desiderata in the department to which the report relates. If the "Grand Concours International" corresponds to the scheme which the Committees have worked out, it will be one of the most complete and suggestive Exhibitions that have yet been held.

ON August 7 the University of Göttingen will celebrate the 150th anniversary of its foundation.

THE annual *conversazione* given by the students of the Finsbury Technical College was held on Friday the 15th inst., and was remarkably successful. The College was tastefully decorated with flowers and flags, and a large fountain, illuminated by powerful coloured arc and incandescent lamps, played during the evening. All the rooms were thrown open to visitors, and exhibitions of chemical, electrical, and mechanical apparatus and manufactures were arranged in the laboratories. Over fifty of the leading scientific firms lent exhibits, and one electrical firm sent over £500 worth of apparatus. In the workshops specimens of the work of the students during the session were shown. Two concerts, both attended by crowded audiences, were given; and Prof. Ayrton lectured on "Church Bells," and Prof. Meldola on "Spectrum Analysis." Over four hundred visitors were present, including many distinguished men of science and commerce; and the students are to be congratulated on having provided a very pleasant entertainment for their friends.

THE additions to the Zoological Society's Gardens during the past week include a Pig-tailed Monkey (*Macacus nemestrinus*) from Java, presented by Mrs. Lewis; a Tiger (*Felis tigris* ♂) from India, presented by Mr. Sandford Kilby; a Turtle-Dove (*Turtur communis*), British, presented by Mr. R. Humphries; a Bonnet Monkey (*Macacus sinicus* ♀) from India, two Booted Eagles (*Nisaetus pennatus*) from Spain, a Golden-crowned Conure (*Conurus aureus*) from Brazil, two Alligators (*Alligator mississippiensis*) from the Mississippi, two Common Toads (*Bufo vulgaris*) from North Africa, deposited; a Ruffed Lemur (*Lemur varius*) from Madagascar, an Elate Hornbill (*Ceratogymna elata*) from West Africa, two Common Boas (*Boa constrictor*) from South America, purchased; a Squirrel-like Phalanger (*Belideus sciureus*) born in the Gardens; two Diuca Finches (*Diuca grisea*), an Auriculated Dove (*Zenaida auriculata*) bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

THE NICE OBSERVATORY.—M. Faye has published in the *Comptes rendus*, tome cv. No. 1, a note on the work of the Nice Observatory, from which the following particulars are extracted:—As soon as a small meridian circle by Gautier had been erected at the new Observatory, M. Perrotin, the Director determined the difference of longitude telegraphically from Paris and from Milan. These operations gave for the difference: Paris-Milan, 27m. 25·325s., whilst a direct determination previously made by MM. Perrier and Celoria gave 27m. 25·313s. The value 43° 43′ 16″·9 has been provisionally adopted for the latitude. With the equatorial of 0·38 m. aperture M. Perrotin has undertaken an extensive series of double-star measures, which have already proved of great excellence and value. It is proposed to continue these measures on a more extended scale with the large telescope of 0·76 m. aperture. A large number of observations of comets and of minor planets have been made by M. Perrotin and by M. Charlois, his assistant. The latter has also quite recently discovered a new asteroid (No. 267). M. Faye goes on to speak of the spectroscopic researches carried out at Nice by the late M. Thollon, particularly those connected with the investigation of the telluric lines in the solar spectrum. As our readers will remember, M. Thollon showed that in the regions B and α of the solar spectrum some of the telluric lines are due, not to an element varying with the temperature, such as aqueous vapour, but to a constituent of the atmosphere, such as oxygen, the influence of which varies with the altitude of the Sun only. M. Egoroff afterwards confirmed this by showing that the lines referred to are due to the oxygen present in our atmosphere.

The instrumental equipment of the Nice Observatory is now all but complete, and M. Faye speaks with enthusiasm of the career of usefulness before it—favoured as it is with a splendid climate, and, thanks to the munificence of M. Bischoffsheim, with instruments which suffice to place it in the front rank of modern Observatories.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1887 *JULY* 24-30.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on July 24

Sun rises, 4h. 14m.; souths, 12h. 6m. 14·3s.; sets, 19h. 59m.; decl. on meridian, 19° 54′ N.: Sidereal Time at Sunset, 16h. 8m.

Moon (at First Quarter on July 27) rises, 8h. 38m.; souths, 15h. 26m.; sets, 22h. 0m.; decl. on meridian, 5° 53′ N.

Planet.	Rises.	Souths.	Sets.	Decl. on meridian.
	h. m.	h. m.	h. m.	°
Mercury	5 20	12 33	19 46	13 24 N.
Venus	8 33	15 1	21 29	4 47 N.
Mars	2 8	10 28	18 48	23 53 N.
Jupiter	12 20	17 35	22 50	9 29 S.
Saturn	3 48	11 48	19 48	20 57 N.

Occultation of Star by the Moon (visible at Greenwich).

July.	Star.	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image.
			h. m.	h. m.	° °
25	B.A.C. 4277	6	20 20	20 45	34 350

July.	h.	
24	4	Venus in conjunction with and 3° 8′ south of the Moon.
27	1	Jupiter in conjunction with and 3° 59′ south of the Moon.
29	5	Mercury in inferior conjunction with the Sun.

Meteor-Showers.

The Aquarids, R.A. 340°, Decl. 13° S., near δ Aquarii, form the principal meteor-shower at this season of the year; the meteors from this radiant are slow, in marked contrast to those from Perseus, radiant at R.A. 32°, Decl. 55° N., at the same time, which are swift.